

CLAIMS

1. A recombinant eucaryote cell or organism with the provisio that it is not a human germ cell line, a human zygote, a human embryo or a human individual, said 5 cell or organism having incorporated in its genome

(i) a genetic construct made of at least one nucleotide sequence and possibly a selectable marker, said sequence encoding a toxic gene (TOX) under the control of an inducible promoter/operator genetic sequence and

10 (ii) a genetic sequence encoding an antidote molecule to said toxic molecule with the condition that the sequence encoding the antidote molecule is not present natively in said cell or organism.

2. The recombinant eucaryote cell or 15 organism according to the claim 1, wherein the genetic sequence encoding the antidote molecule is under the control of an inducible promoter/operator genetic sequence.

3. The recombinant eucaryote cell or organism according to claim 1 or 2, wherein the genetic 20 sequence encoding a toxic molecule is a genetic sequence encoding a poison protein, selected from the poison/antidote group.

4. The recombinant eucaryote cell or organism according to the claim 3, wherein the genetic 25 sequence encoding the toxic molecule is a genetic sequence encoding a poison protein selected from the group consisting of CcdB, ParE, RelE, Kid, Doc, MazF, Hok proteins.

5. The recombinant eucaryote cell or 30 organism according to claim 1 to 4, which is a plant or a plant cell.

6. The recombinant eucaryote cell or organism according to claim 1 to 4, which is an animal cell

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or an animal organism, preferably a mammalian cell or a mammalian organism.

7. The recombinant eucaryote cell according to claim 1 to 6, which is a yeast cell.

5 8. The recombinant eucaryote cell or organism according to anyone of the preceding claims, wherein the inducible promoter/operator genetic sequence is induced by a non-toxic compound, preferably a exogenous compound or a compound that is synthesized by the 10 eucaryotic cell or organism itself, preferably at a specific stage of its development or in a specific tissue.

9. The recombinant eucaryote cell or organism according to anyone of the preceding claims, which further comprises integrated into the genome, a genetic 15 sequence which is the target of the toxic molecule.

10. The recombinant eucaryote cell or organism according to anyone of the preceding claims, wherein the genetic construct is integrated into the genome of specific cell compartments, such as chloroplasts or 20 mitochondria.

11. The recombinant eucaryote cell or organism according to anyone of the preceding claims, wherein the selectable marker is bordered by two different or identical toxic genes.

25 12. A production and selection method of a genetically modified eucaryote cell or organism having integrated into their genome foreigner (exogenous) DNA fragment(s) which comprises the steps of (i) providing the recombinant eucaryote cell or organism according to any one 30 of the preceding claims 1 to 11 with the genetic construct carrying the toxic gene integrated therein, (ii) providing a construct carrying said foreigner DNA fragment; (iii) obtaining the integration, in the genome of the recombinant eucaryote cell, of said foreigner (exogenous) DNA

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fragment(s) at the insertion site where the genetic construct is integrated; (iv) selecting the genetically modified eucaryote cell or organism having integrated said foreigner (exogenous) DNA fragment(s) under condition allowing the expression of the toxic molecule in said cells or organisms; and (v) recovering said genetically modified eucaryote cells or organisms which do not express said toxic molecule following the integration of the foreigner (exogenous) DNA fragment(s).

10 13. The production and selection method according to claim 12, wherein said foreigner (exogenous) DNA fragment(s) are integrated into the genome of the recombinant eucaryote cell or organism preferably by homologous recombination between the sequence of said 15 foreigner (exogenous) DNA fragment(s) and the sequence of the genetic construct integrated into the genome of the recombinant eucaryote cell or organism.

14. The method according to claim 12 or 13 wherein said eucaryote cell or organism is a plant or a 20 plant cell transfected by a Ti-plasmid incorporating the toxic gene and being preferably present in Agrobacterium tumefaciens and wherein a complete transgenic plant is possibly obtained from the recovered genetically modified plant cell.